NON-PUBLIC?: N
ACCESSION #: 9504250396
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Peach Bottom Atomic Power Station Unit 3 PAGE: 1 OF 3

DOCKET NUMBER: 05000278

TITLE: Unit 3 Scram on Low Condenser Vacuum due to Loss of Steam
Jet Air Ejector
EVENT DATE: 03/23/95 LER #: 95-001-00 REPORT DATE: 04/19/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 065

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
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Assessment Manager

COMPONENT FAILURE DESCRIPTION:
CAUSE: SYSTEM: COMPONENT: MANUFACTURER:
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 3/23/95, the main steam supply valve to the 'B' Steam Jet Air Ejector (SJAE) system isolated when its air-operator failed closed. This caused a rapid decrease in Main Condenser vacuum. At 1618 hours, with reactor power reduced to 65%, an auto half-scram signal was received due to low condenser vacuum. Therefore, the unit was manually scrammed. An investigation has determined that excessive leakage around the diaphragm in the air-operator caused the isolation. Following the event, the scram and isolation logics were reset and affected systems were restored to appropriate conditions. Replacement diaphragms were installed in both SJAE trains and tested satisfactorily. An investigation is currently underway to identify the cause of the excessive air leakage. Additionally, the Steam Jet Air Ejector/Off-Gas system is being evaluated to determine ways to increase its overall reliability. No actual safety consequences occurred as a result of this event. No previous similar LERs have been identified.

END OF ABSTRACT

Requirements for the Report

This report is submitted to satisfy the requirements of 10 CFR 50.73(a)(2)(iv) because of unplanned Engineered Safety Feature Actuations.

Unit Conditions at Time of Event

Unit 3 was in the RUN mode at approximately 100 % of rated thermal reactor (EIIS:RPV) power when the 'B' Steam Jet Air Ejector (SJAE) (EIIS:WF) train was lost. Reactor power was reduced to approximately 65 % power at the time of the scram. The 'A' SJAE train was administratively blocked out of service to repair a valve packing leak. There were no systems, structures, or components that were inoperable that contributed to the event.

Description of Event

On 3/23/95 at 1612 hours, Unit 3 SJAE HI-LO Pressure and Offgas Trouble alarms were received in the Main Control Room. At this time, Main Condenser vacuum began decreasing. A rapid reactor shutdown was commenced in accordance with General Procedure (GP-9-3) "FAST REACTOR POWER REDUCTION" and the "Condenser Low Vacuum" Operational Transient Procedure (OT-106). Condenser vacuum continued to decrease. Plant Operators were immediately dispatched to the SJAE but the recovery activities could not be implemented in enough time to restore Main Condenser vacuum. At 1618 hours, with the Reactor at approximately 65 % power, a reactor auto half scram signal (EIIS:JC) was received due to the rapidly decreasing main condenser vacuum. Therefore, the unit was manually scrammed by placing the mode switch in the SHUTDOWN position. A Primary Containment Isolation System (PCIS) (EIIS:JM) Group II/III isolation occurred as expected due to Reactor water level dropping below 0" as a result of void collapse upon insertion of the control rods. Reactor water level dropped to -22 inches but was restored and maintained using the Reactor Feed Pumps (RFP) (EIIS:SK). Following the event, the scram and PCIS Group 11/111 isolation logics were reset. Affected systems were restored to their appropriate conditions and the reactor feedwater system was used for level control. The NRC was notified of the

event at 1759 hours.

Cause of Event

The cause of the scram and PCIS isolations was the loss of the SJAE system which caused a Main Turbine Condenser low vacuum condition. An investigation has determined that the cause of the loss of the SJAE system was excessive leakage around

a diaphragm in the air-operator of the main steam isolation valve for the 'B' SJAE train. The air-operator failed closed on loss of air pressure due to diaphragm leakage, thereby isolating the supply of "driving" steam to the 'B' air ejectors. The rate of condenser vacuum loss during this transient was too rapid to be mitigated by swapping to the 'A' SJAE train had it been available.

Analysis of Event

No actual safety consequences occurred as a result of this event. Although plant systems are designed to mitigate a low condenser vacuum scram from 100% power, Operations personnel performed a fast power reduction to minimize the effect of a potential plant scram upon isolation of the Off-Gas/Recombiner (OGR) system. In addition, all automatic PCIS isolations and Reactor Protection System initiations functioned properly.

Corrective Action

Following the event, the scram and PCIS Group II/III isolation logics were reset. Affected systems were restored to appropriate conditions.

An investigation is currently underway to identify the cause of the excessive air leakage on the air-operator of the main steam isolation valve for the 'B' SJAE train.

A replacement diaphragm was installed and the isolation valve was stroked several times verifying no leakage. The diaphragm on the 'A' SJAE air-operator was also replaced and tested satisfactorily. An analysis of similar air-operators installed in other plant systems verified that a loss of air pressure would not significantly affect plant operations. The Unit 2 SJAE steam isolation valve operators were replaced in October, 1994 with a new, more reliable design.

In addition, the Steam Jet Air Ejector/Off-Gas system is being evaluated by engineering to determine ways to increase its overall reliability.

Previous Similar Events

No previous similar LERs have been identified which involved the loss of the SJAE or other diaphragm failures on air-operators.

Garrett D. Edwards
Plant Manager Peach
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April 19, 1995

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Docket No. 50-278

SUBJECT: Licensee Event Report, Peach Bottom Atomic Power Station-Unit 3

This LER concerns a shutdown when the Plant was manually tripped on loss of Main Condenser vacuum.

Reference: Docket No. 50-278
Report Number: 3-95-001
Revision Number: 00
Event Date: 03/23/95
Report Date: 04/19/95
Facility: Peach Bottom Atomic Power Station

RD1, Box 208, Delta, PA 17314

This LER is being submitted pursuant to the requirements of 10 CFR 50.73 (a)(2)(iv).

Sincerely,

GDE/GAJ:gaj

enclosure

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